Space Weather Forecast

Issued on Friday, 14 October 2022 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Decreasing chance of Moderate class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a Moderate flare observed from a moderately sized region in the northwest early in the day. Common class flaring was also observed from a nearby, smaller and magnetically less complex region in the northwest. There are a total of four numbered sunspot regions on the disc, however the remaining two regions are currently smaller and simpler. There are also a number of filaments (lines of solar material held together above its surface by the Sun's magnetic field) on the Earth-facing disc and these can be a source of coronal mass ejections (CMEs). One of these erupted in the southern centre disc early on the 13th, however this is not expected to be Earth directed.

Solar Wind / Geomagnetic Activity: The solar wind for much of the day was steady around 300 km/s, after erratically easing from around 380 km/s. However, in the evening a temporary increase occurred, with a peak speed of 448 km/s occurring at 13/2010. The total magnetic field was weak, with the north-south field predominantly in the southward direction (negative) but too weak to result in any notable geomagnetic activity. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: Despite Moderate flaring from the large sunspot on previous days, the count rate of energetic particles (high energy protons) remained at background levels. Consequently no solar radiation storms occurred.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with the main risk of Moderate flares from the moderately sized region in the northwest. However, as this region will rotate off the visible disc later today or early tomorrow, the risk of Moderate class flares decreases through the forecast period. Also, no significant regions are expected to rotate onto the visible disc.

Solar Wind / Geomagnetic Activity: Overall Earth will continue with solar winds at background levels. However, there is a slight chance of minor enhancements today and tomorrow from either a weak CME that has a small chance of giving a peripheral influence as it passes Earth, and also from the arrival of a weak enhancement from a small coronal hole feature. In addition there is also a slight chance of another weak CME brushing Earth on the 17th, from yesterday's southern hemisphere filament eruption, but this CME is most likely to miss Earth. Geomagnetic activity will be mainly Quiet but with isolated Unsettled intervals, perhaps increasing to Active with any fast wind or CME arrival.

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Energetic Particles / Solar Radiation: The count rate of energetic particles is except to remain at background, but could rise in response to any large flares, mainly from the sunspots in the northwest. This gives a very slight chance of exceeding the Minor Radiation Storm threshold.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	25	15	5	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	2	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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